

THE AMOEBA AS THE CAUSE OF THE SECOND GREAT TYPE OF CHRONIC ARTHRITIS

PRELIMINARY NOTE

By LEONARD W. ELY, M. D.,
Associate Professor of Surgery, San Francisco,

ALFRED C. REED, M. D.,
Assistant Clinical Professor of Medicine, San Francisco,
And

HARRY A. WYCKOFF, M. D.,
Clinical Pathologist,
Stanford University Medical School, San Francisco.

By the second great type of arthritis we mean that form of arthritis hitherto described by the Germans as arthritis deformans, by the English as osteoarthritis, by Goldthwait as hypertrophic arthritis, by Nichols and Richardson as degenerative arthritis, and by other writers under various titles. This is the senile form of arthritis, the chronic rheumatism of the elderly. For want of a better name some writers have called it metabolic arthritis, a singularly unfortunate and quite meaningless term.

In previous papers¹ Ely has set forth the pathology at length, emphasizing the fact that the primary change is a necrosis in the bone marrow in the region of the joint, and that all subsequent changes in the bone and in the cartilage are the result of this necrosis. All efforts to find the cause of the necrosis have been in vain. Everything in the bone indicated that the changes are caused by some form of organism, which killed by shutting off the blood supply, but all attempts to find the organism have been fruitless. We had been searching for a bacterium, in spite of the fact that the pathological anatomy of this disease, both gross and histologic, was absolutely different from that of the arthritides caused by bacteria, e. g., the tubercle bacillus, the treponema pallidum, the diplostreptococcus, etc. Ely has repeatedly called attention to the presence of infection about the roots of the teeth in patients with this type of arthritis.

Some months ago the conception of the relationship of amoeba to this problem was suggested by Doctor J. V. Barrow, of Los Angeles, who had been working with Professor C. A. Kofoid, and who had found the amoeba histolytica (sive dysenteriae) in the stools of one of Ely's patients. Since then we have pursued this line of investigation in the Stanford Medical School and are conducting the work as a joint research. A full report of our investigations will be published at a later date. Doctor J. A. Campbell of the Dental Department of the Stanford Clinic has rendered valued assistance.

Paraffin sections of the bone in the region of necrotic areas from this type of arthritis were cut 4 to 8 microns thick. Stained by the standard iron hæmatoxylin method, the sections showed organisms identified as endamoeba histolytica. These organisms were abundant in the region of

necrotic areas in the marrow, but not actually in the necrotic areas. They were especially abundant in the immediate vicinity of the capillaries. Photomicrographs will appear in a later communication. We appreciate that we are but on the threshold of the problem, and this progress note is published to stimulate criticism and promote further research. It is only proper to state that our findings lack unanimous confirmation.

We ask for material removed at operation upon patients with this type of arthritis. It should be placed immediately in Schaudinn's solution at a temperature of 50° C., and may be mailed to us in a sealed container.

ON THE OCCURRENCE OF ENDAMOEBA DYSEN- TERIAE IN BONE LESIONS IN ARTHRITIS DEFORMANS

By CHARLES A. KOFOID, Ph. D., Sc. D.,

And

OLIVE SWEZY, Ph. D.

Contribution from the Zoological Laboratory, University of California, and the Division of Parasitology, Bureau of Communicable Diseases, California State Board of Health, Berkeley, California.

A portion of the head of a human femur removed by operation in a case of arthritis deformans, fixed in formalin, decalcified and sectioned by Dr. Leonard W. Ely and stained in iron hæmatoxylin and examined in the zoological laboratory at the University of California, reveals a pure infection of amoebæ about the characteristic lesions in the bone. No stained bacteria have been found in our examination. The amoebæ are somewhat localized about the centers of necrosis near the articular surface. They are more abundant around the capillaries in the peripheral zone around the lesions. The organisms interpreted by us as amoebæ are unlike known normal or pathological tissue cells. They have the characteristic nuclear structure or *Endamoeba dysenteriae* Councilman and Lafleur, found in tissues about amoebic ulcers in intestinal amoebiasis. Their nuclei are unlike those of *Endamoeba gingivalis* found in gingival abscesses and in granulomas of extracted teeth. Their nuclei are unlike the characteristic nuclei of other known parasitic amoebæ of man, and unlike those of normal and pathological tissue cells as figured in standard treatises and found by us in available preparations of human bone and bone marrow. The stained amoebæ show many instances of characteristic amoeboid pseudopodia. Their distribution is unlike that of any known tissue element.

In the interest of further investigation, it is desirable that stool examinations for amoebæ be made in cases of arthritis deformans. Stools for such examinations may be sent for three to six successive days in legal mailing cases only, or by prepaid express to the Division of Parasitology, State Hygienic Laboratory, Berkeley, California, for examination by the writers.

¹ Ely, Leonard W. The Great Second Type of Chronic Arthritis—Further Studies. California State J. of Med., 1921, v. XIX, 415.